

Trend Study 15-8-99

Study site name: Garden Basin.

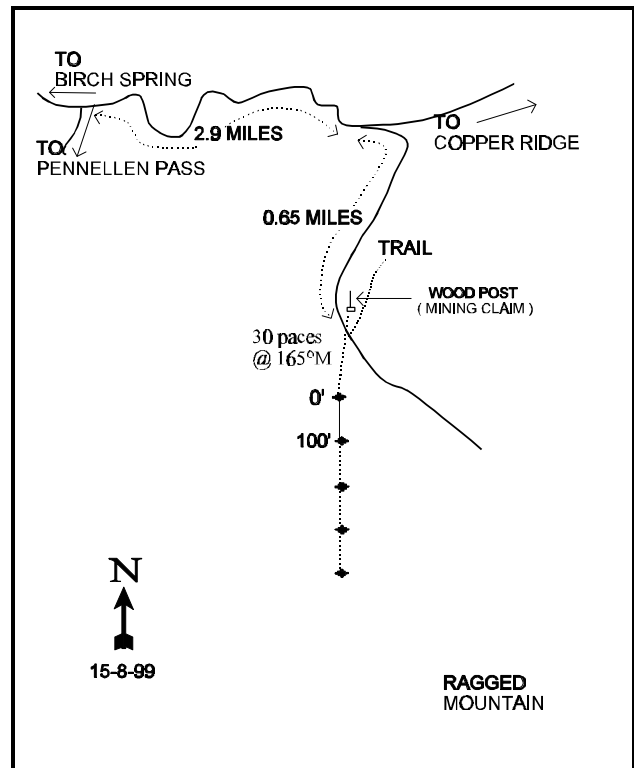
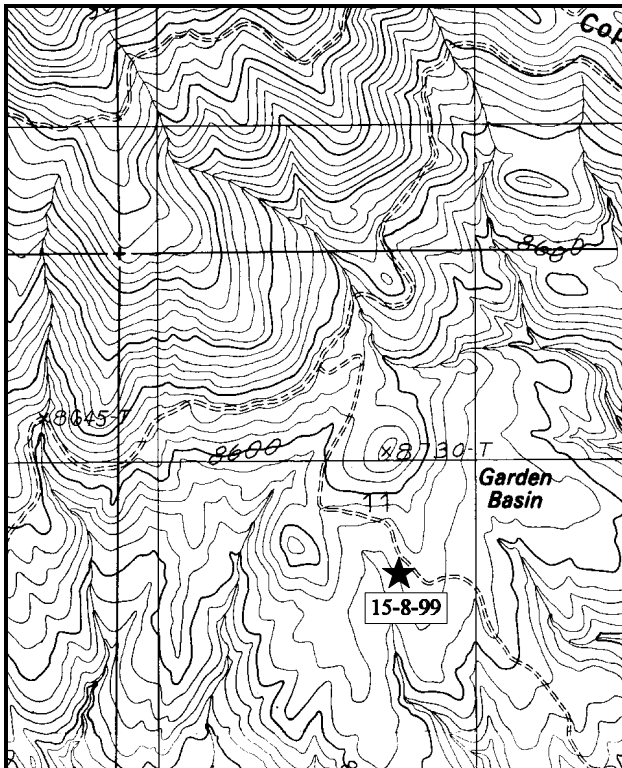
Range type: Pinyon-Juniper.

Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

This transect can be reached from Birch Spring by driving southwest 5.1 miles to a major intersection. Bear left and continue 2.9 miles to a road on the right. Turn and go down this road south toward Ragged Mountain for 0.65 miles to a white PVC mining claim post on the left side of the road. The 0-foot baseline stake is 30 paces away at a bearing of 165°M, and is marked by browse tag #7133.



Map Name: Mount Ellen

Diagrammatic Sketch

Township 32S, Range 10E, Section 11

UTM 4209602.004 N, 519849.173 E

DISCUSSION

Trend Study No. 15-8(38-8)

The Garden Basin area has been proposed for habitat improvement by the BLM and is included as a project in the Henry Mountain Coordinated Resource Management Plan. This site should be discontinued unless it is treated. The site is expected to be a key area for both deer and buffalo following conversion to a grass-forb type with a variety of shrub species. The site is located on a southeast facing, pinyon-juniper slope (3%) at an elevation of 8,500 feet. The study area lies between Mt. Ellen and Ragged Mountain near the upper elevational limits of the pinyon-juniper woodland. Point quarter data taken in 1999 estimates 147 pinyon and 25 juniper trees/acre. Average basal diameter for pinyon is about 11 inches while juniper is 8 inches. Line intercept data from 1999 estimated canopy of pinyon-juniper at 34%. Precipitation is expected to be about 14 inches per year. Water is not available locally, but Box Springs is about two miles to the southwest. Wildlife use is light with an estimated 1 deer day use/acre (3 ddu/ha). Livestock do not use the site.

Soils are a reddish-grey, clay loam with a neutral pH (7.1). The parent material is granite. The soil is moderately shallow with an estimated effective rooting depth of just under 10 inches. The profile is very rocky with all of the penetrometer readings used to determine the stoniness index lying in the upper 3 decimeters. The surface horizon is generally low in organic matter except for areas beneath tree canopies. Erosion potential is moderate on this site due to the absence of herbaceous cover, but the gentle slope keeps erosion at a minimum. Although there is erosion pavement present, there are no active gullies in the area. Nutrients in the soil are low with 7 ppm phosphorus and 41 ppm potassium. These values are below the minimum of 10 ppm and 70 ppm thought necessary for normal plant development.

The key browse species that could be released by a chaining treatment are antelope bitterbrush, serviceberry, and black sagebrush. None of these species are currently abundant. Black sagebrush is the most numerous with a population of approximately 460 stunted plants/acre in both 1994 and 1999. This species is more abundant in the interspaces between pinyon-juniper trees. Percent decadency declined from 52% to 39% between 1994 and 1999. However, the number of plants displaying poor vigor increased from 17% to 26%. Two-thirds of the decadent plants sampled are dying. Thirty-five percent of the plants showed moderate use with another 17% demonstrated heavy use in 1999. However, the hedged appearance of black sagebrush is probably more a reflection of the poor site potential and competition from mature pinyon and juniper trees than use from wildlife. The serviceberry population is composed of mature plants that have been moderately or heavily utilized. Currently, density is estimated at 100 plants/acre. Bitterbrush density is currently estimated at 340 plants/acre, up slightly from 1994. Most show moderate use (47%) with another 35% expressing heavy use. True mountain mahogany has an estimated density of 160 plants/acre, made up mostly of mature plants that have been moderately utilized over the years. One-fourth of the plants classified with poor vigor.

There are no herbaceous species that could be considered to be key for this area at the present time. Grasses and forbs combined to produce <1% cover in 1994, and only 3% in 1999. The very low numbers of understory species and cover will continue, unless mechanical intervention and seeding is employed to control the dominant overstory of pinyon and juniper trees. The site potential is steadily going down through time as the soils are continually being lost from runoff without protective herbaceous cover. This is the only site that is low in both phosphorous and potassium.

1994 TREND ASSESSMENT

Basic ground cover characteristics are similar to those of 1987, but percent bare ground has increased while rock and pavement cover combined, have declined. Indicating some overland flow of soils covering the rock. There are no active gullies on the site, but sheet erosion is occurring with the lower rock and pavement values.

Trend for soil is stable to slightly down and in poor condition. Browse on the site are not particularly abundant and all have poor biotic or reproductive potentials. Black sagebrush and antelope bitterbrush increased in density since 1987, but this increase is likely the result of the larger sample size taken in 1994. Until the pinyon and juniper are treated, these shrubs will remain static or slowly declining in number and vigor. Trend for browse is slightly down at this time due to increasing decadency rates of the key browse species. The herbaceous understory is insignificant on this site and of little importance. All grasses and forbs combined produce <1% cover. Sum nested frequencies for perennial grasses and forbs have remained stable since 1987.

TREND ASSESSMENT

soil - stable to slightly declining and in poor condition due to the lack of an herbaceous cover

browse - slightly down

herbaceous understory - stable, but nearly nonexistent

1999 TREND ASSESSMENT

Trend for soil is stable, but remains in poor condition due to the lack of an herbaceous understory. Erosion is minimal only because of the gentle slope. Browse trend is down. Black sagebrush shows high decadency (39%) with two-thirds of these are dying. Plants displaying poor vigor is high (26%), and recruitment and biotic potential are low. Serviceberry is in very low densities and has no recruitment. Bitterbrush remains at stable densities, but has received heavy use in the past and has no recruitment. Trend for the herbaceous understory is stable, but severely lacking.

TREND ASSESSMENT

soil- stable, but in poor condition

browse- down

herbaceous understory- stable, but severely lacking

HERBACEOUS TRENDS --

Herd unit 15 , Study no: 8

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'84	'89
G	Bromus tectorum (a)	-	1	-	-	1	-	.00	-
G	Festuca ovina	_b 7	_a -	_a -	4	-	-	-	-
G	Oryzopsis hymenoides	4	3	7	3	1	3	.03	.06
G	Poa spp.	2	2	-	2	2	-	.01	-
G	Poa fendleriana	-	2	2	-	2	2	.01	.01
G	Sitanion hystrix	_b 22	_a -	_a 6	12	-	2	-	.01
Total for Annual Grasses		0	1	0	0	1	0	0.00	0
Total for Perennial Grasses		35	7	15	21	5	7	0.05	0.08
Total for Grasses		35	8	15	21	6	7	0.05	0.08
F	Allium spp.	_b 14	_b 13	_a -	7	6	-	.05	-
F	Androsace septentrionalis (a)	-	-	1	-	-	1	-	.00
F	Arabis spp.	-	2	1	-	1	1	.00	.00
F	Astragalus spp.	_{ab} 3	_b 7	_a -	1	3	-	.01	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'04	'09
F	Chaenactis douglasii	_b 26	_{ab} 15	_a 9	15	8	5	.04	.05
F	Eriogonum alatum	_a -	_{ab} 4	_b 8	-	2	6	.03	.08
F	Gayophytum ramosissimum (a)	-	_b 46	_a -	-	19	-	.09	-
F	Hymenoxys acaulis	-	2	3	-	1	1	.00	.03
F	Ipomopsis aggregata	3	-	1	2	-	1	-	.00
F	Lappula occidentalis (a)	-	2	-	-	2	-	.01	-
F	Lesquerella kingii	19	19	9	11	10	7	.05	.03
F	Lomatium spp.	_a -	_b 21	_b 11	-	11	5	.05	.02
F	Polygonum douglasii (a)	-	_b 127	_a 43	-	54	19	.27	.09
F	Unknown forb-perennial	3	-	-	2	-	-	-	-
F	Zigadenus paniculatus	_a 2	_b 16	_b 27	1	7	15	.04	.17
Total for Annual Forbs		0	175	44	0	75	20	0.37	0.10
Total for Perennial Forbs		70	99	69	39	49	41	0.30	0.40
Total for Forbs		70	274	113	39	124	61	0.68	0.50

Values with different subscript letters are significantly different at $\alpha = 0.10$

BROWSE TRENDS --

Herd unit 15 , Study no: 8

Type	Species	Strip Frequency		Average Cover %	
		'04	'09	'04	'09
B	Amelanchier utahensis	4	5	1.00	.84
B	Artemisia nova	16	17	.99	.36
B	Artemisia tridentata vaseyana	0	0	-	-
B	Cercocarpus montanus	4	5	.76	1.00
B	Gutierrezia sarothrae	0	0	-	-
B	Juniperus osteosperma	0	4	.63	.45
B	Opuntia spp.	0	0	-	-
B	Pinus edulis	0	9	13.81	16.75
B	Purshia tridentata	9	12	1.45	1.23
B	Symphoricarpos oreophilus	2	1	.03	.03
Total for Browse		35	53	18.68	20.68

CANOPY COVER --

Herd unit 15 , Study no: 8

Species	Percent Cover '09
Pinus edulis	34

BASIC COVER --

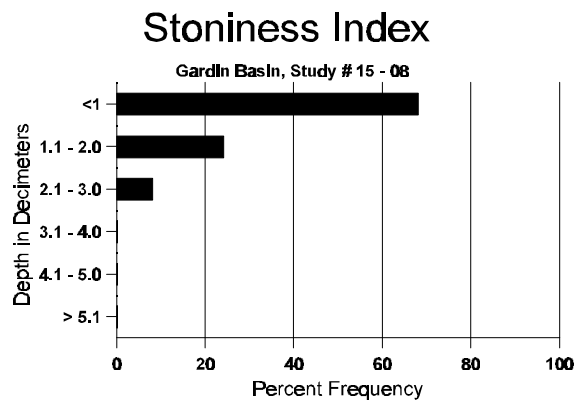
Herd unit 15 , Study no: 8

Cover Type	Nested Frequency		Average Cover %		
	'94	'99	'87	'94	'99
Vegetation	193	118	1.00	19.64	25.64
Rock	279	222	20.25	19.14	21.79
Pavement	241	235	15.50	3.79	13.54
Litter	386	348	55.00	46.25	47.06
Cryptogams	7	13	0	.07	.09
Bare Ground	244	213	8.25	13.21	12.76

SOIL ANALYSIS DATA --

Herd Unit 15, Study # 08, Study Name: Garden Basin

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
9.9	45.4 (10.9)	7.1	45.3	26.2	28.6	3.4	7.1	41.6	0.9



PELLET GROUP DATA --

Herd unit 15 , Study no: 8

Type	Quadrat Frequency		Pellet Transect Days Use/Acre (ha)
	'94	'99	
Rabbit	21	25	N/A
Deer	2	3	1 (2)
Buffalo	-	-	1 (2)

BROWSE CHARACTERISTICS --

Herd unit 15 , Study no: 8

Field unit 15, Study no. 8																		
A Y G R E	Y	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier utahensis																		
S	87	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	4	2	-	-	-	-	-	-	-	6	-	-	-	200			6
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	1	-	-	-	-	-	-	-	1	-	-	-	33	79	98	1
	94	2	-	-	1	-	-	-	-	-	2	1	-	-	60	53	64	3
	99	-	1	-	-	1	-	1	-	2	5	-	-	-	100	49	54	5
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'87		43%				00%				00%				-66%				
'94		00%				00%				00%				+20%				
'99		40%				40%				00%								
Total Plants/Acre (excluding Dead & Seedlings)												'87	233	Dec:	0%			
												'94	80		25%			
												'99	100		0%			
Artemisia nova																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	87	-	1	-	-	-	-	-	-	-	-	-	1	-	33			1
	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	7	-	-	1	-	-	-	-	-	8	-	-	-	160	9	17	8
	99	1	8	2	1	-	-	-	-	-	12	-	-	-	240	10	21	12
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	12	-	-	-	-	-	-	-	-	8	-	-	4	240			12
	99	7	-	2	-	-	-	-	-	-	3	-	-	6	180			9
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'87		100%				00%				100%				+93%				
'94		00%				00%				17%				+ 0%				
'99		35%				17%				26%								
Total Plants/Acre (excluding Dead & Seedlings)												'87	33	Dec:	0%			
												'94	460		52%			
												'99	460		39%			

A Y G R E	Form Class (No. of Plants)	Vigor Class									Plants Per Acre	Average (inches) Ht. Cr.		Total			
		1	2	3	4	5	6	7	8	9		1	2		3	4	
Artemisia tridentata vaseyana																	
M	87	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	0	9	19	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	0	23	26	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
		'87			00%			00%			00%						
		'94			00%			00%			00%						
		'99			00%			00%			00%						
Total Plants/Acre (excluding Dead & Seedlings)											'87	0	Dec:	-			
											'94	0		-			
											'99	0		-			
Cercocarpus montanus																	
M	87	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	4	-	-	-	-	-	-	-	-	4	-	-	80	29	35	4
	99	-	6	-	-	-	-	-	-	-	6	-	-	120	32	36	6
D	87	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	1	-	-	-	-	-	1	-	-	20			1
	99	2	-	-	-	-	-	-	-	-	-	-	-	40			2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
		'87			00%			00%			00%						
		'94			00%			00%			+38%						
		'99			75%			00%			25%						
Total Plants/Acre (excluding Dead & Seedlings)											'87	0	Dec:	0%			
											'94	100		20%			
											'99	160		25%			
Gutierrezia sarothrae																	
S	87	1	-	-	-	-	-	-	-	-	1	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	5	-	-	-	-	-	-	-	-	5	-	-	166			5
	94	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	0	4	4	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
		'87			00%			00%			00%						
		'94			00%			00%			00%						
		'99			00%			00%			00%						
Total Plants/Acre (excluding Dead & Seedlings)											'87	166	Dec:	-			
											'94	0		-			
											'99	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Juniperus osteosperma																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	2	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
M	87	-	-	-	-	-	-	-	1	-	1	-	-	-	33	177	79	
	94	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40	-	-	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		00%			00%			00%										
'94		00%			00%			00%										
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	33	Dec:	-			
												'94	0		-			
												'99	80		-			
Opuntia spp.																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	22	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		00%			00%			00%										
'94		00%			00%			00%										
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	0	Dec:	-			
												'94	0		-			
												'99	0		-			
Pinus edulis																		
S	87	49	-	-	-	-	-	-	-	-	49	-	-	-	1633		49	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	1	-	-	1	-	-	1	-	-	1	40		2	
Y	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	4	-	-	-	-	-	3	-	-	7	-	-	-	140		7	
M	87	1	1	-	-	-	-	3	-	-	5	-	-	-	166	126	87	5
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	2	-	-	-	-	-	2	-	-	4	-	-	-	80	-	-	4
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		17%			00%			00%										
'94		00%			00%			00%										
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	199	Dec:	-			
												'94	0		-			
												'99	220		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
Y	87	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	94	6	-	2	2	4	-	-	-	-	14	-	-	-	280	11	14	
	99	2	8	-	-	-	6	-	-	-	16	-	-	-	320	12	16	
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	1	-	-	-	1	-	-	-	-	2	-	-	-	40		2	
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		00%			00%			00%			+90%							
'94		31%			13%			00%			+ 6%							
'99		47%			35%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	33	Dec:	0%			
												'94	320		13%			
												'99	340		6%			
Symphoricarpos oreophilus																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40	14	2	
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40	17	2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'87		00%			00%			00%										
'94		00%			00%			00%			+ 0%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'87	0	Dec:	-			
												'94	40		-			
												'99	40		-			